"Rack"

Field of the Invention

This invention relates to a rack for receiving and supporting an item from a upstanding support.

Background

In the storage of items, it is common practice to provide a rack which extends outwardly from a support (such as a wall). However, when the rack is unoccupied, it can present a difficulty in terms of usage of the space occupied for the rack.

A particular application of the invention relates to the storage of bicycles. The bicycle can present a problem in regard to its secure storage in a manner which is convenient. With the increased degree of medium density living the storage of a bicycle can present a problem.

Disclosure of the Invention

Accordingly, the invention resides in a rack intended in use to be supported from a support, the rack comprising a base adapted to be fixed to the support, a support member connected to the base to be pivotable about a first axis which is generally level, to be moveable between a first position, at which it is adjacent to the support and a second position at which it extends laterally from the support, the support member being adapted to receive and support an item when in its second position.

According to one embodiment, support member is pivotable from the base about a generally upright axis.

According to a preferred feature of the invention, the support member is provided along at least a portion of its length with a first space adapted to receive a portion

of the item. According to a preferred feature of the invention, the first space is configured in the form of a slot. According to a further preferred feature of the invention, the outer end of the first space is closed. According to a further preferred feature of the invention, the outer end of the support member is provided with an edge which is adapted to extend across the outer end of the first space to provide a guide surface. According to a preferred feature of the invention, the edge is defined by a first transverse member across the outer end of the first space. According to a preferred feature of the invention the edge has an upwardly directed concave profile. According to a preferred feature of the invention, the support includes a transverse surface which defines the inner end of the first space. According to a preferred feature of the invention, the transverse surface is provided by a cross member extending across the inner end of the first space.

According to a preferred feature of the invention, the rack further comprises a brace member, the brace member being pivotally supported from the base for pivotable movement about a second axis, the first and second axes being parallel and spaced from each other, the brace member being moveable with the support member such that, when the support member is in its second position, the brace member provides support to the support member. According to a further preferred feature of the invention, the support member and brace member are interengaged outward of their pivotable mountings such that movement of the support member causes movement of the brace member.

According to a preferred feature of the invention, the brace member is provided with a second space which cooperates with the space defined by the support member to provide a combined space wherein the second space provides an upright extent to the combined space while the first space provides a lateral extent to the combined space.

According to one embodiment, the rack further includes a storage shelf adapted to receive and store further items, the storage shelf being supported from a side of the support member to extend transversely outward from the support member.

According to a preferred feature of the invention the rack is adapted to support the wheel of a bicycle within the space defined by the support member.

The invention will be more fully understood in the light of the following description of several specific embodiments.

Brief Description of the Drawings

The description is made with reference to the accompanying drawings of which:

Figure 1 is a perspective elevation view of bicycle rack according to the first embodiment in a collapsed condition;

Figure 2 is a perspective elevation view of bicycle rack according to the first embodiment in an extended condition;

Figure 3 is a side elevation view of bicycle rack according to the first embodiment supporting a bicycle;

Figure 4 is a perspective elevation view of a bicycle rack according to the second embodiment of the invention in an extended condition;

Figure 5 is a perspective elevation view of a bicycle rack according to the third embodiment in an extended condition;

Figure 6 is a perspective elevation view of a bicycle rack according to the third embodiment in an extended condition with the shroud and mounting shown in an exploded form; and

Figure 7 is a side elevation view of the bicycle rack according to the third embodiment supporting a bicycle.

Detailed Description of the Specific Embodiments

Each of the embodiments comprises a rack 10 which in use is to be supported from an upstanding support such as a wall and is intended to receive a bicycle whereby, when the rack is not in use, it can be collapsed so as to minimise obstruction. In addition in each of the embodiments the bicycle is stored by supporting a wheel of the bicycle whereby the forces which are exerted on the wheel are similar to those for which the wheel is designed in order that the likelihood of the wheel being distorted by such storage is reduced when compared to methods which involve supporting the wheel at each side of the plane of the wheel off-centre from the axle or suspending the wheel from the inner perimeter of the rim.

In the case of the first embodiment (as shown at Figures 1 to 3), the rack 10 comprises a generally planar base 12 which is adapted to be mounted, by conventional means, to a wall, though, if desired, it could be supported from a post, pillar or like element having an upstanding surface.

The rack 10 further comprises a support member 14 which is pivotally supported from the base 12 through a hinge housing 16 to be pivotable, about a generally level axis, between a first position at which it is adjacent to the wall (as shown Figure 1) and a second position at which position it extends laterally from the wall (as shown Figure 2) to be able to receive and support a bicycle wheel.

The support member 14 is formed from a single length of mild steel rod which is bent to provide a pair of parallel elongate arms 20 which are spaced from each other to provide a first space between themselves, where the free end portions 24 of the arm are pivotally received in the hinge housing 16. The other ends of the arms are outermost and are interconnected by a bridging portion 22. The bridging portion 22 has a concave profile which is downwardly directed, when the support member is in the second position as shown at Figures 2 and 3 and which is intended to serve as a guide for the wheel of a bicycle which is to be supported by the rack 10. The support member 14 further comprises a cross-member 28 which extends between the arms 20 of the support member 14

intermediate of the length of the support member 14. The cross-member 28 has a V-shaped configuration and is to be generally coplanar with the support member. The arms 20, bridging portion 22 and cross member 28 define a closed space 26 having the configuration of a slot which is dimensioned to receive a portion of the wheel of the bicycle to be supported from the rack 10 whereby the outer periphery of the wheel is engaged at two angularly spaced positions around the perimeter of the wheel by the bridging portion 22 and cross-member 28.

The rack 10 further comprises a brace member 18 which provides support for the support member 14 when in its second position. The brace member 18 is also pivotally supported from the base 12 and is also formed from a single length of mild steel rod bent at its mid-point to provide a pair of arms 30 where the free ends 13 of the arms 30 are pivotally supported from the base 12 by a pair of second hinge sleeves 17. The other ends of the arms 30 are interconnected by a second bridging portion 32. The brace member 18 is received in the space 26 and the outer ends of the arms 30 each support a laterally outwardly directed stop member 34 which is intended to receive and support the undersurface of arms 20 of the support member 14.

The interengagement between the support member 14 and brace member 18 is such that movement of the support member 14 from its first position to its second position effects corresponding movement of the brace member 18.

In use, and as shown at Figure 3, the front wheel of a bicycle is receivable in the spaces 26 of the support member 14 and the remainder of the bicycle is suspended from the front wheel. To mount a bicycle to the rack 10, the support member 14 is pivoted to its second position and the front wheel of the bicycle is raised such that the front wheel engages with the bridging portion 22 of the support member 14. In this regard, the rack 10 is preferably mounted at a height such that the front wheel will engage the bridging portion 22 of the support member 14 when the front wheel has been raised from the ground but while the rear wheel of the bicycle remains in contact with the ground. With an additional

lifting force being applied to the bicycle, the bridging portion 22 is able to guide the front wheel of the bicycle into the space 26 and support a portion of the weight of the bicycle as the wheel rolls into engagement with the space 26. Because of the leverage function of the front wheel when engaged with the bridging porion 22 the user is not required to accommodate for the full weight of the bicycle since much of the load (even initially is accepted by the support member through the bridging portion 22.

The second embodiment, as shown at Figure 4 (the same reference numerals will be used to denote corresponding components), is identical to the first embodiment but also includes a removable shelf 19 supported from one of the arms 20 of the support member 14. The shelf 19 is generally coplanar with the arms 20 so that, when the support member 14 is in its first position, the shelf 19 lies adjacent to the wall and does not appreciably protrude therefrom. The shelf 19 may be utilised for storage of additional items, for example helmets and/or other cycling gear when the support member is in its second position.

The third embodiment, as shown at Figures 5, 6 and 7 (the same reference numerals will be used to denote corresponding components), is a variation of the first embodiment in that the support member 14 and brace member 18 are not only pivotable about generally level axes, but also are pivotable about a generally upright axis. To this end, the base 12 comprises an elongate member 40 from which the support member 14 and brace member are pivotally supported. The elongate member 40 is supported at each end by mounting brackets 42A and 42B through a pivot plates 44A and 44B respectively. The brackets 42A and 42B are adapted to be fixed to the wall The third embodiment further comprises a shroud 46 and end caps 48 which jointly cover the brackets 42A and 42B and the elongate member 40 and which serves to enhance the appearance of the rack 10.

In addition, the space 26, defined between the arms 20 of the support member 14, is not defined at its inner end by a cross-member, as in the case of the first and second embodiments, but rather by forming the inner ends of the

arms to be inwardly convergent. In addition, the brace member 18 is slidably engaged with the arms 20 of the support member 14 through a pair of opposed lugs 29 on the arms 20 of the support member which limit the slidable movement of the brace member along the space. Each of the arms 30 are formed towards their lower ends with outwardly directed formations 34 which engage with the underneath of the arms 20 of the support member 14. Because the lugs 29 are located intermediate of the length of the space 26, the brace member provides additional support through the engagement of the formations 34 with the underneath of the support member, for the wheel of the bicycle when supported from the support member. In addition the brace serves to limit the pivotal movement of the wheel about the central axis of the space 26.

As illustrated in Figure 5 the pivoting facility offered by the elongate member 40 as illustrated in enables the support member 14 and brace member 18, and the bicycle supported thereby, to be jointly moved between a position to either side of the support brackets 42A and B close to the upstanding a wall (as shown in broken lines at Figure 5) and a position extending outwardly from the wall (as shown in solid lines at Figure 5). This reduces the extent to which the stored bicycle extends from the wall to provide a space-saving advantage.

In a further embodiment, the brace member extends upwardly from the base to the support member, to support the support member in its second position.

Owing to the generally planar nature of the support member, brace member and base of each embodiment, the rack in its collapsed condition (i.e. when the bracing and support members are in their first positions) does not protrude laterally to an appreciable extent, thereby offering a space-saving advantage.

Throughout the specification, unless the context requires otherwise, the word "comprise" or variations such as "comprises" or "comprising", will be understood to imply the inclusion of a stated integer or group of integers but not the exclusion of any other integer or group of integers.

It should be appreciated that the scope of the present invention need not be limited to the particular scope of the embodiments described above. In particular the invention is not restricted in its scope to the storage of bicycles but can have application to the storage of other articles such as surfboards, canoes and the like. In addition the support can comprise any structure which enables the rack to be mounted such that it can receive an item and in the case of a rack intended to support a bicycle can include a support adapted to be mounted to a vehicle to facilitate the transport of the bicycle